

Message Text

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E.O. 11652: NA

TAGS: TGEN, US, UR

SUBJECT: US-USSR COOPERATION IN S&T: ELECTROMETALLURGY: ELECTRON-BEAM EVAPORATION (01.03-03)

1. EMBASSY RECEIVED 19 JANUARY LETTER (IN ENGLISH) DATED 5 JANUARY FROM PROFESSOR B.A. MOVCHAN FOR PROFESSOR R.F. BUNSHAH. TEXT FOLLOWS.

2. QUOTE. MY COLLEAGUES AND I WOULD LIKE TO THANK YOU ONCE MORE FOR THE FRIENDLY WARM WELCOME GIVEN US DURING OUR VISIT TO THE USA AND FOR INTERESTING SCIENTIFIC DISCUSSIONS.

3. RESULTS OF OUR FURTHER DISCUSSION OF POINT 3 OF THE PROGRAM "ELECTRON BEAM VACUUM EVAPORATION OF METALLIC AND NON-METALLIC MATERIALS" COME TO THE FOLLOWING:

4. A) AIRCO TEMESCAL WILL NOT TAKE PART AT PRESENT IN A JOINT DEVELOPMENT OF ELECTRON BEAM EQUIPMENT.

5. B) DR. HUGH SMITH SHOWED SOME INTEREST IN CARRYING OUT OF JOINT WORKS FOR PRODUCTION OF ELECTRON-BEAM EQUIPMENT.

6. I SHOULD LIKE, THEREFORE, TO ASK YOU AGAIN TO RETURN TO THE ITEM OF JOINT DEVELOPMENT AND PRODUCTION OF GENERAL PURPOSE ELECTRON BEAM INSTALLATION (POINT 3) SIMULTANEOUSLY WITH MAKING MORE PRECISE POINT 2 OF OUR JOINT PROGRAM.

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7. IN ACCORDANCE WITH THE PLAN OF THE PROGRAM "ELECTRON BEAM

VACUUM EVAPORATION OF METALLIC AND NON-METALLIC MATERIALS" I SEND YOU SOME EVAPORATION TECHNIQUE DATA AND FIVE SAMPLES OF INITIAL REFRACTORY COMPOUNDS FOR MAKING THE OBTAINED RESULTS MORE PRECISE, IN PARTICULAR, FOR DETERMINATION OF FREE ZIRCONIUM PRESENCE IN SAMPLES 2-3 AND 2-1.

8. AN EVAPORATION OF REFRACTORY COMPOUNDS WAS CARRIED OUT FROM COMPACTED POWDER BILLETS OF 50 MM DIAMETER AND 60 MM HEIGHT.

9. THE BILLETS WERE OBTAINED BY PRESSING THE POWDER OF APPROPRIATE REFRACTORY COMPOUND AND SUBSEQUENT SINTERING AT 1800-2400 DEGREES C IN A PURE HYDROGEN MEDIUM.

10. THE EVAPORATION WAS CARRIED OUT IN (10 EXP -4 TO 5 X 10 EXP -5) MM HG VACUUM FROM COPPER WATER-COOLED CRUCIBLES. TO OBTAIN THE COATINGS OF BINARY SYSTEMS THE EVAPORATION WAS PERFORMED FROM TWO SEPARATE CRUCIBLES. THE WORK CONDITION OF ELECTRON BEAM GUNS: ACCELERATING VOLTAGE - 16 KV, BEAM CURRENT - 1.0 - 1.5A.

11. CONDENSATION OF VAPORS OF SUBSTANCES BEING INVESTIGATED WAS DONE ON SUBSTRATES OF 170X60X0.5 SHEET MOLYBDENUM. BEFORE BEING PLACED THE SUBSTRATES WERE CLEANED AND DEGREASED. THEN THE SUBSTRATES WERE PLACED INTO A SPECIAL DEVICE HEATED BY AN ELECTRON BEAM FOR OBTAINING A UNIFORM TEMPERATURE GRADIENT FROM 800 UP TO 1600 DEGREES C. DISTRIBUTION OF TEMPERATURE ALONG THE SUBSTRATE WAS CONTROLLED WITH TUNGSTEN-RHENIUM THERMOCOUPLES. THE DISTANCE FROM THE SURFACE OF MATERIAL BEING EVAPORATED UP TO SUBSTRATE WAS 260-280 MM.

12. THE CONDENSATION SPEED WAS EQUAL TO 1-3 M/MIN. THICKNESS OF THE OBTAINED CONDENSATES WAS 25-75 M(SIC).

13. I BELIEVE THAT THESE DATA TOGETHER WITH THOSE YOU OBTAINED EARLIER WILL ALLOW YOU TO PRESENT AN INTERESTING JOINT REPORT AT THE INTERNATIONAL CONFERENCE "METALLURGICAL COATINGS."

14. IN THE NEAREST FUTURE I HOPE TO RECEIVE FROM YOU THE SPECIMENS OF HARD-ALLOY PLATES FOR DEPOSITION AND TESTING THE COATINGS(MET-CUT OR MANLABS). WE HOPE ALSO TO RECEIVE IN JANUARY FROM YOU THE TIC-CO SAMPLE (TITANIUM CARBIDE-COBALT). END QUOTE. STOESSEL
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